PIONEER

Service Manual

ORDER NO.
HRT-234-0

POCKETABLE STEREO FM/AM CASSETTE PLAYER

PK-F9 US, CA, E, WE

SPECIFICATIONS

Radio Section

Frequency range ..... FM: 88~108MHz
AM: 530~1,600kHz

Tape player and common sections

Tape track ..... Compact stereo cassette
Frequency response ..... Normal: 40~12,000Hz
Metal: 40~15,000Hz
Input jack ..... DC IN
Output jack ..... PHONES (3.5φ stereo mini-jack × 1)
Output load impedance 8~300Ω
Rated maximum output ..... 20mW + 20mW (32Ω load, DC)
Battery life (continuous) ..... Tape playback: Approx. 4.5 hours
(at 1mW output) using SUM-3 batteries
Approx. 9 hours (at 1mW output) using AM-3 batteries
Tuner use: Approx. 16 hours
(at 1mW output) using SUM-3 batteries
Approx. 32 hours (at 1mW output) using AM-3 batteries
Power requirements ..... DC 3V (SUM-3 × 2)
EXT. DC 3V (center ⊖)
Dimensions ..... 145(W) × 80(H) × 32(D)mm
[5-3/4(W) × 3-1/8(H) × 1-1/4(D)in.]
Weight ..... 400g (including batteries)
[14-1/8oz. (including batteries)]
(Subfunctions) ..... Automatic reverse
One-side stop
Tape selector (Metal, Chrome/Normal)
Dolby NR (B type)
LOW/HIGH tone switch
Music Search
(Indicators) ..... FWD/BATT (red LED)
REV (red LED)
STEREO (red LED)

Note: Specifications and design are subject to change without notice.

- For the mechanism description, please refer to the supplement of model PK-R7AW service manual (HRT-230).
- 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

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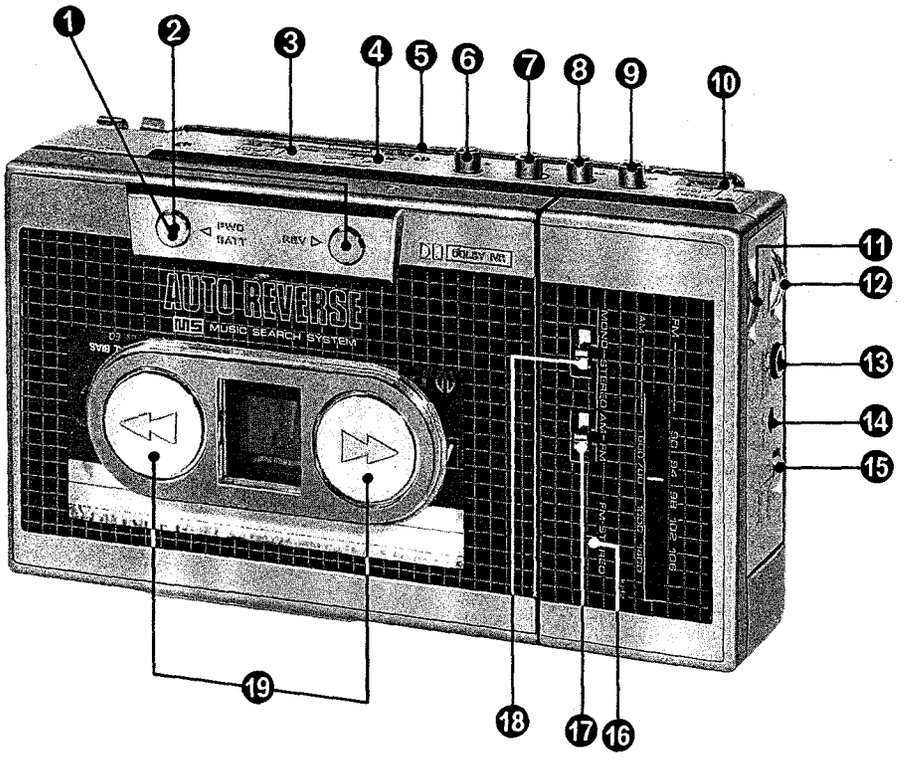
CONTENTS

1. NAME OF EACH PART AND OPERATION 1
2. DISASSEMBLY 4
3. PARTS LOCATION 5
4. CIRCUIT DESCRIPTION 6
5. ADJUSTMENT 8
6. DIAL STRINGING 17
7. SCHEMATIC CIRCUIT DIAGRAM 18
8. CONNECTION DIAGRAM 20
9. CHASSIS EXPLODED VIEW 23
10. CASSETTE MECHANISM EXPLODED VIEW ... 26
11. PACKING METHOD 29
12. ELECTRICAL PARTS LIST 30

1. NAME OF EACH PART AND OPERATION

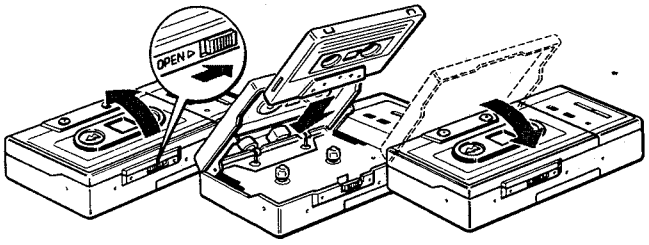


When reading operation section, refer to photo.

1. Battery (BATT) indicator
2. Tape travel direction indicator
3. Tape switch
4. Dolby Noise Reduction (DOLBY NR) switch
5. Telescopic antenna
6. One-side stop button
7. Program change button (◁▷)
8. Stop (STOP) button
9. Play (PLAY) button
10. Radio/Tape (RADIO/TAPE) switch
11. Tuning (TUNING) knob
12. Volume (VOLUME) knob
13. Phones (PHONES) jack
14. DC IN jack
15. Tone quality switch
16. FM stereo (FM STEREO) indicator
17. AM/FM switch
18. Mono/Stereo (MONO/STEREO) switch
19. Fast forward/Rewind button

• How to Listen to a Tape

1. Load a cassette tape.

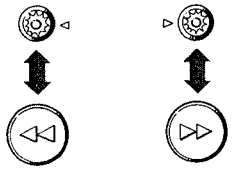


2. Connect headphones to the PHONES jack ⑬.
3. Place the RADIO/TAPE switch ⑩ in the TAPE position.
4. Press the PLAY button ⑨.
5. Adjust the volume using the VOLUME knob ⑫.
6. Place the tone quality switch ⑮ in the desired position.
7. Stop the tape using the STOP button ⑧.

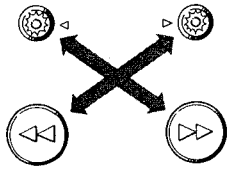
• How to Perform Fast Forward/Rewind

Perform with the PLAY button ⑨ in the OFF position.

1. For fast forward, press the fast forward/rewind button ⑲ which is on the same side as the tape travel indicator ❷.



2. For rewind, press the fast forward/rewind button ⑲ which is on the opposite side from the tape travel indicator ❷.



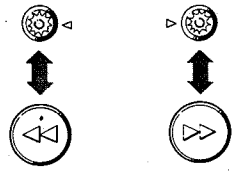
3. To stop fast forward or rewind along the way, press the STOP button ⑧ or the PLAY button ⑨.

- The auto stop mechanism does not work for fast forward and rewind. When the tape has wound fully, the tape will stop but power will not be switched off.
  If left in this condition, the batteries will discharge, so be sure to press the STOP button.
- Tape travel direction can be changed directly from rewind to fast forward or from fast forward to rewind by pressing the fast forward/rewind button on the side opposite to the direction in which the tape is traveling.

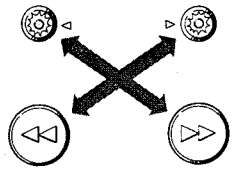
• How to Perform Music Search

Place the PLAY button ⑨ in the ON position.
Music Search automatically seeks out the unrecorded pauses between the recorded portions of a tape, stops, and begins playback at the beginning of a recorded portion.

1. To skip over the music currently being listened to, press the fast forward/rewind button ⑲ which is on the same side as the tape travel direction indicator ❷.



2. To repeat the music currently being listened to, press the fast forward/rewind button ⑲ which is on the opposite side from the tape travel direction indicator ❷.

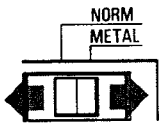


3. When the beginning of the music is reached, fast forward or rewind will be released and the music will start playing automatically from the beginning.

In order for the Music Search function to work properly, a "space" (portion with no sound) of about four seconds is required between music selections.
The Music Search function will not work properly with the following types of prerecorded tapes. This does not mean that the unit is malfunctioning.

- Recordings of conversations. Music Search will be activated by natural pauses between speakers' words and sentences of four seconds or more.
- Recordings of music in which an extremely low sound continues for four seconds or more. Music Search is activated by the apparent "pause".
- Recordings with pauses of less than four seconds between recorded portions. Music search will not be activated.

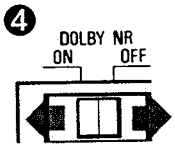
Tape switch ❸



When listening to a normal tape.

When listening to a metal tape or a chrome tape.

DOLBY NR switch ❹



When listening to a tape which has been recorded using Dolby noise reduction.

One-side stop button ❻

Press to listen to one side of the tape only. After listening to that side of the tape, the PLAY button will be released automatically and the tape will stop.

Program change button ❼

Press to change from side A to side B or from side B to side A of the tape. If the button is pressed, the tape travel direction indicator will change.
If the program change button is pressed when the one-side stop button is in the ON position, the PLAY button will be released and the tape will stop.

How to Listen to the Radio

1. Connect headphones to the PHONES jack ⑬.
2. Place the RADIO/TAPE switch ⑩ in the RADIO position.
3. Set the AM/FM switch ⑰ to the desired band.
4. Select a station using the TUNING knob ⑪.
5. Adjust the volume using the VOLUME knob ⑫.
6. Adjust the tone quality as desired using the tone quality switch ⑮.
7. Set the RADIO/TAPE switch ⑩ to the TAPE position to turn power off.

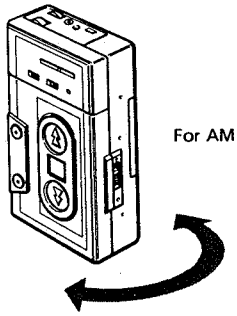
For Best Reception Sensitivity

For FM Broadcasts

The telescopic antenna and the headphone cord act as antennas. For strong stations, reception can be obtained using the headphone cord only. For better sensitivity, extend the telescopic antenna all the way out and adjust the direction or angle to the most appropriate position.

For AM Broadcasts

AM broadcasts are received using the built-in antenna. The best reception condition can be obtained by standing the unit up as shown in the illustration and adjusting the direction to the most appropriate position.



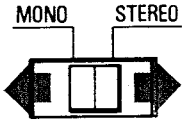
For AM broadcasts

- When listening to a tape, press the STOP button prior to switching to radio listening. If you switch to radio listening while the tape is still playing, the tape may be scratched.
- When used while riding in a train or while walking, radio wave propagation may be interrupted by buildings, power lines, etc., and static may be produced, but this does not mean that the unit is malfunctioning.
- When not listening to radio broadcasts, be sure to place the RADIO/TAPE switch in the TAPE position to turn power off.

FM STEREO indicator ⑯

Lights when an FM stereo broadcast is received.

MONO/STEREO switch ⑱



When the stereo broadcast is weak and difficult to hear due to static.

For normal stereo reception.

2. DISASSEMBLY

• Removing the Rod Antenna

1. Remove screw A to remove the rod antenna.

• Removing the Door Assembly

1. Remove the two screws to remove the door assembly.
2. When reassembling, replace the two screws after passing the cassette holder through the catch on the door assembly.

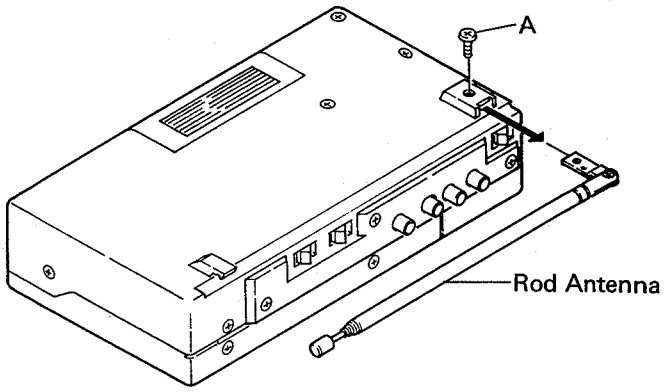


Fig. 1

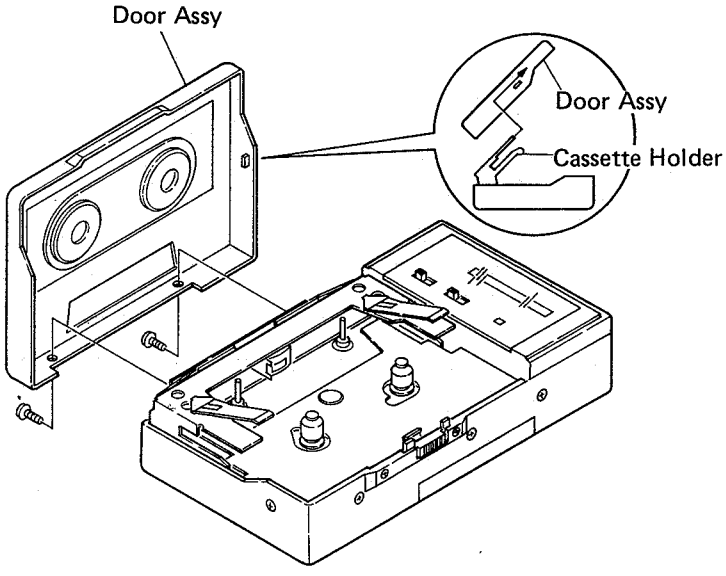


Fig. 2

• Removing the Case Assembly

1. Remove the eleven screw the escutcheon to remove the case assembly.
2. When reassembling, be sure to align the case with the buttons and switches.

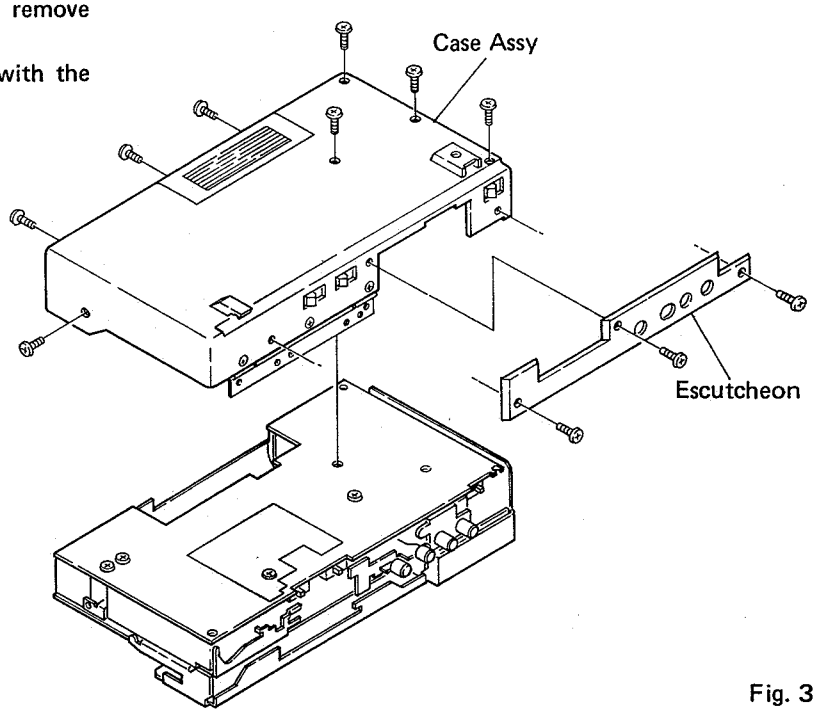


Fig. 3

- **Removing the Cassette Mechanism Assembly**

1. Remove the eleven screws and the escutcheon to remove the case assembly.
2. Remove the front case assembly and then screw B.
3. Remove the cassette mechanism assembly in the direction of the arrow.

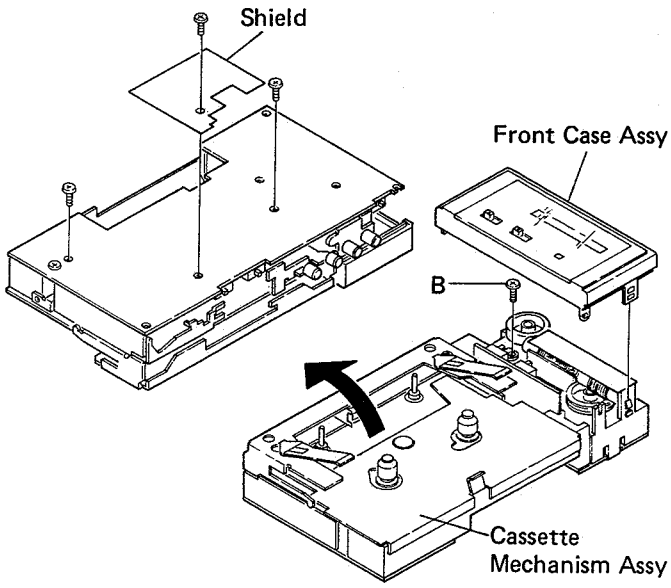


Fig. 4

3. PARTS LOCATION

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

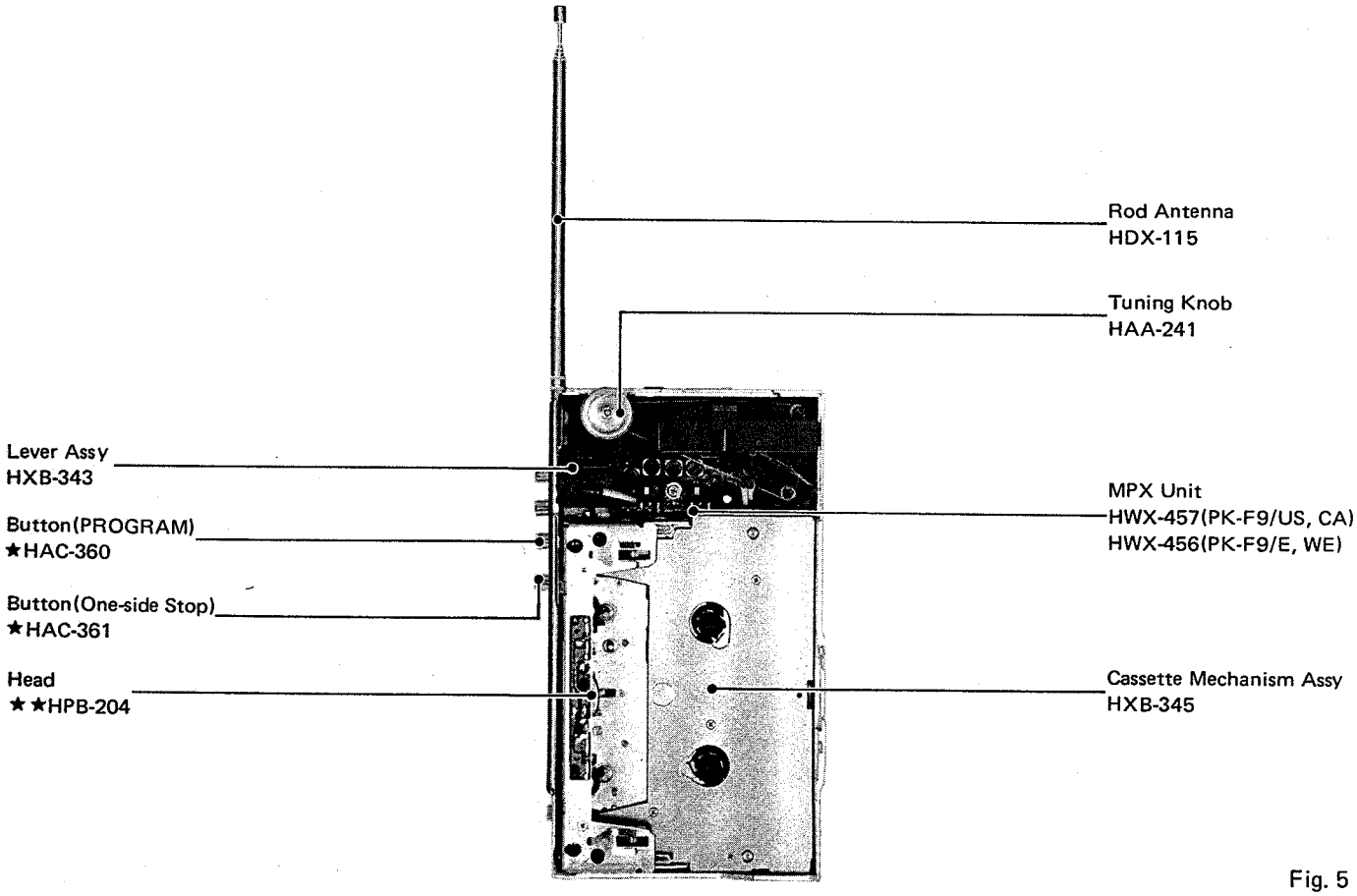


Fig. 5

4. CIRCUIT DESCRIPTION

- **Block Diagram**

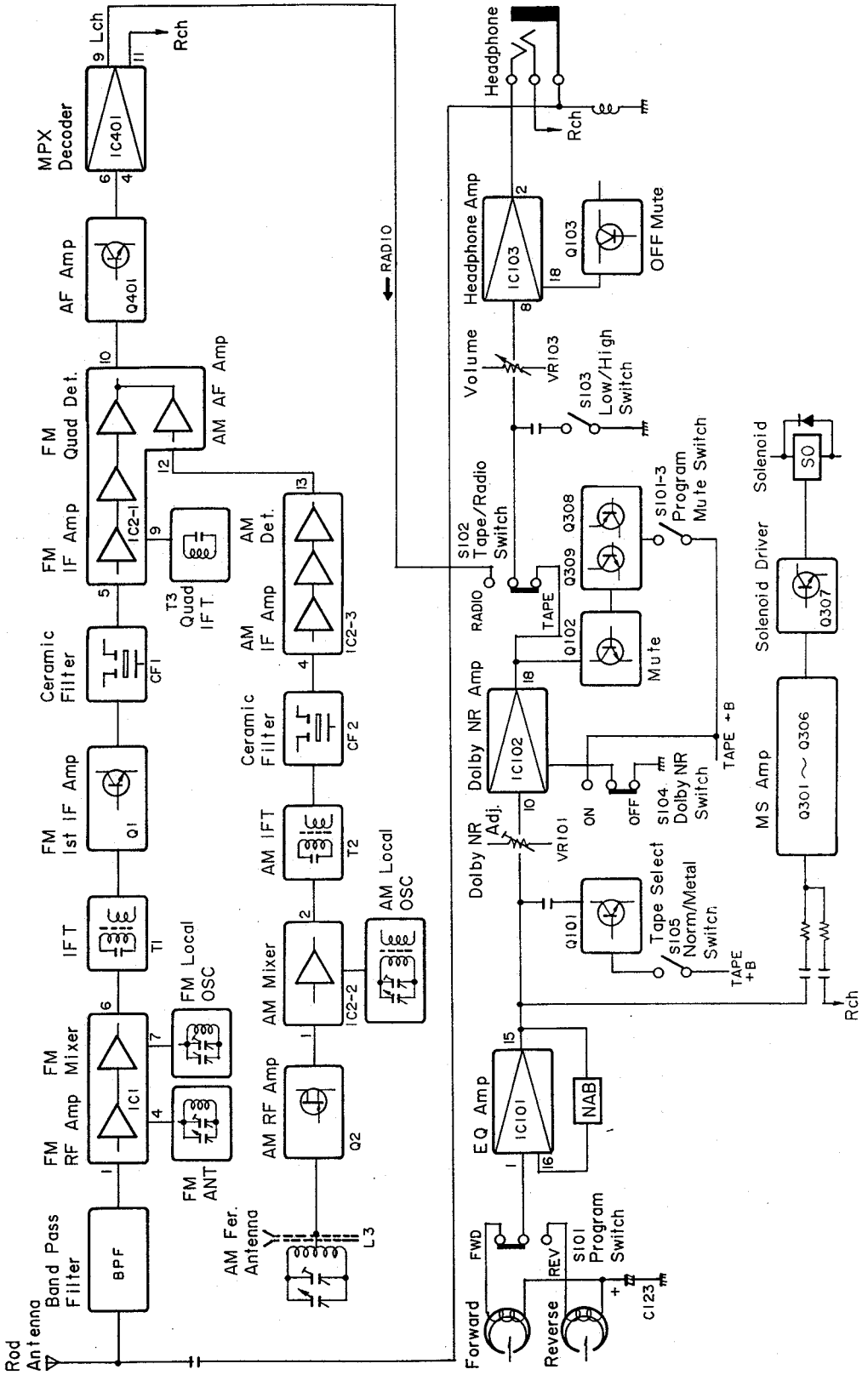


Fig. 6

• Front end

The broadcast signals picked up by the headphone cord or rod antenna are sent to the input filter (BPF1) where only the reception band is selected. IC1 (AN7216) is the FM front end IC, containing an RF amp, MIX and local oscillator. This IC and surrounding circuits select and amplify the desired signal and convert it into an intermediate frequency.

• FM IF amp

At the FM IF amp and detector, Q1, the ceramic filter (CF1), IC2 (AN7221) and IFT (T3) perform intermediate frequency amplification, amplitude limiting and extract a low frequency signal by the quadrature detection method.

• MPX stage

Q1 is a preamp that amplifies the low frequency signal from the IF circuit by about 10dB. IC401 (BA1360F) is the PLL MPX demodulation IC that demodulates the composite signal into separate left and right signals.

• AM tuner

The bar antenna (L3) has a diameter of 6mm and a length of 50mm. The AM signal received from the antenna passes through the high frequency amplifier Q2 after which it goes to IC2 (AN7221). IC2 is composed of a MIX, OSC, AM IF amp, AGC circuit and detector. Low frequency AM signals also pass through Q401 and IC401 in the same manner as FM signals after which they are sent to the left and right inputs in the audio section.

• Level Diagram

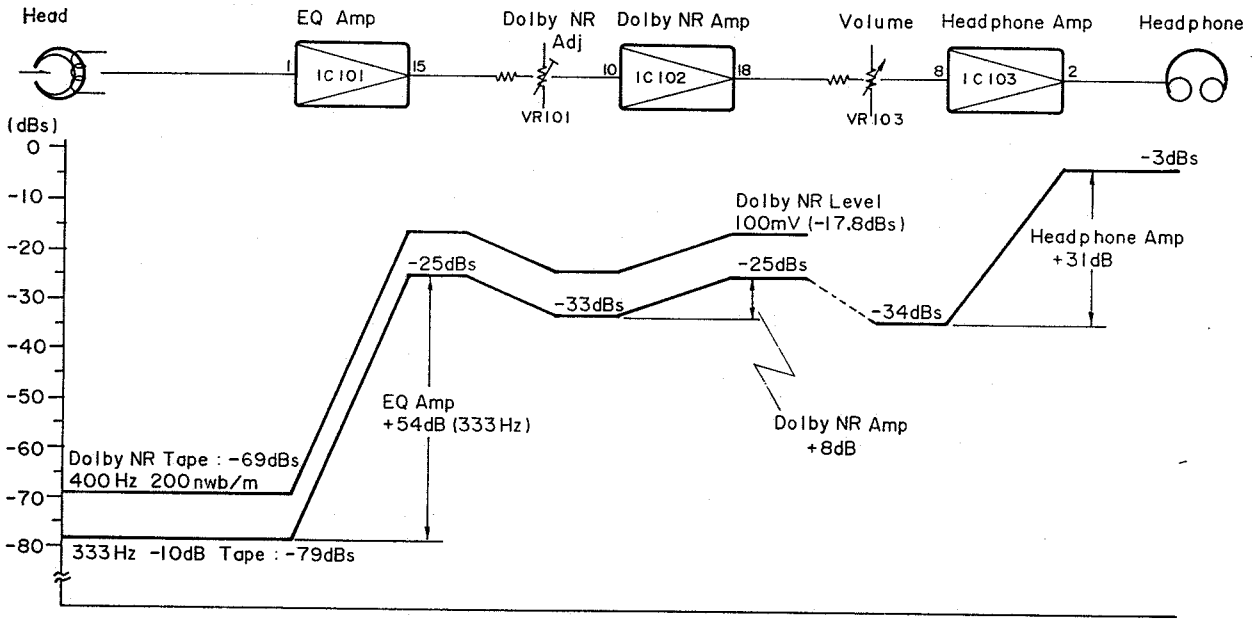
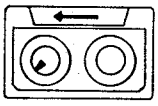
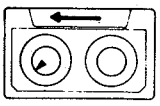
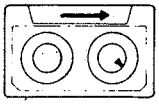
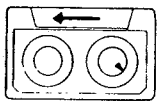
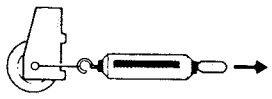


Fig. 7

5. ADJUSTMENT

5.1 CHECK POINTS OF CASSETTE MECHANISM

Confirm the following items when replacing parts of the cassette mechanism.	■ Tape speed deviation: 3,000 ± 90Hz (4.76 cm/s ±3%) Using an STD-301, measure the speed at the start and end of winding and take the maximum value. Measuring time shall be 5 ~ 6 seconds.	■ Wow and flutter: Less than 0.28% (WRMS) Using an STD-301, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5 ~ 6 seconds.
■ Fast forward and rewinding time: **Less than 150 seconds** Using an C-60, set to fast forward and rewind, and measure the time with a stop watch.	■ Winding torque: **28 ~ 48 g.cm**  Using a cassette type torque meter (120 g.cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.	■ F.F torque: **More than 70g.cm**  Using a cassette type torque meter (120 g.cm), measure the value when the tape stops in the F.F. mode.
■ REW torque: **More than 70g.cm**  Using a cassette type torque meter (120 g.cm), measure the value when the tape stops in the REW mode.	■ Back tension torque: **Less than 3.5 g.cm**  After setting in the REW mode without loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.	■ Pinch roller pressure: **170 ~ 205g**  Measure the pressure with a tension meter (1 kg) at the point where the rotor stops rotating at the center of the pinch roller.

5.2 TAPE SPEED ADJUSTMENT

- **Connection Diagram**

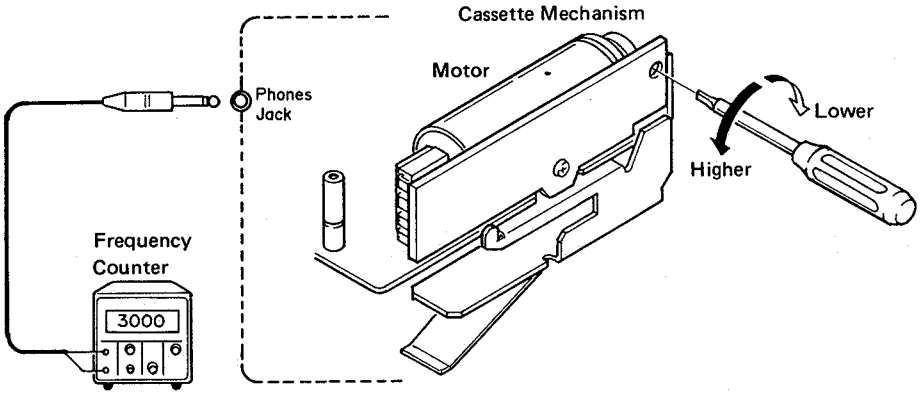


Fig. 8

- **To Adjut**

1. Connect the frequency counter to the phones jack.
2. Play back an STD-301 (3kHz, −10dB) and adjust the semi-fixed resistor on the motor control unit so the frequency counter reads 3000Hz ±90Hz. Rotate clockwise to lower the tape speed and counterclockwise to raise the speed.
3. Repeat this procedure with the tape moving in the opposite direction.

5.3 DOLBY NR ADJUSTMENT

- **Connection Diagram**

Switch position
Dolby NR switch. . . . . .OFF
Volume position
Volume. . . . . MINIMUM

Note: Use an electrically insulated screwdriver to perform these adjustments.

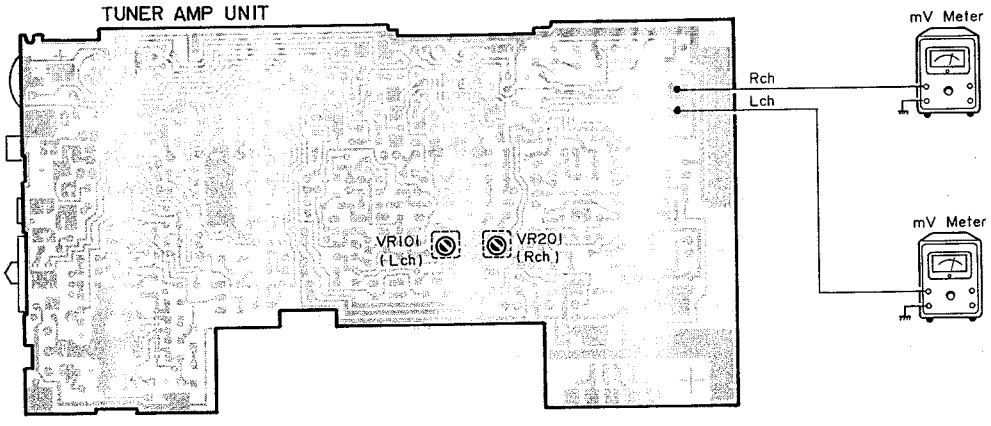


Fig. 9

- **To Adjut**

1. Play back a CT-150 (400Hz, 200nwb/m) in the forward direction and adjust VR101 (Lch) and VR201 (Rch) so the mV meters read 100mV. Rotate clockwise to raise the voltage and counterclockwise to lower the voltage.
2. Confirm that both mV meters read 100mV ±20mV in the reverse playback mode.

5.4 AM IF ADJUSTMENT

- **Connection Diagram**

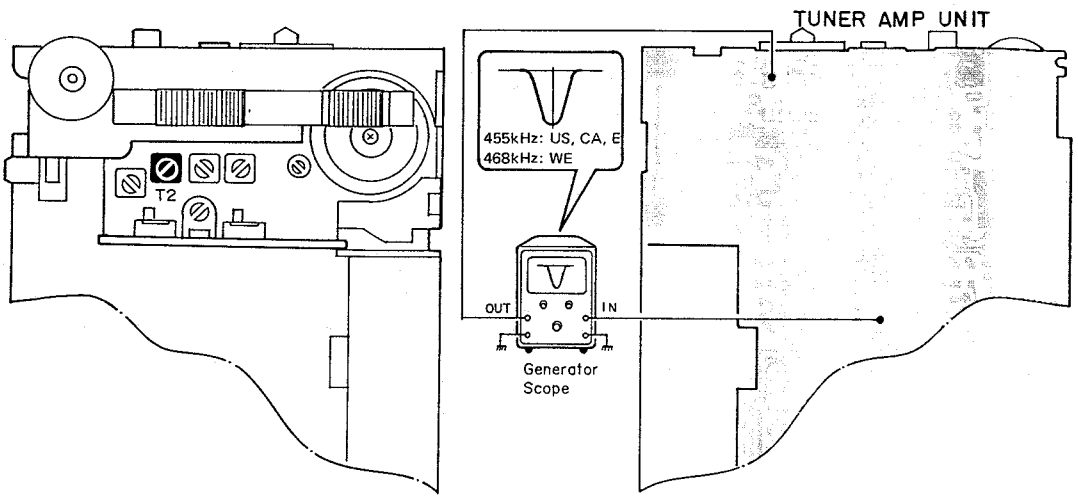


Fig. 10

- **To Adjust**

1. Apply minimum output signal required to check generator scope U curve and adjust T2 so that curve amplitude is at maximum point and there is optimum symmetry.

5.5 AM TRACKING ADJUSTMENT

- **Connection Diagram**

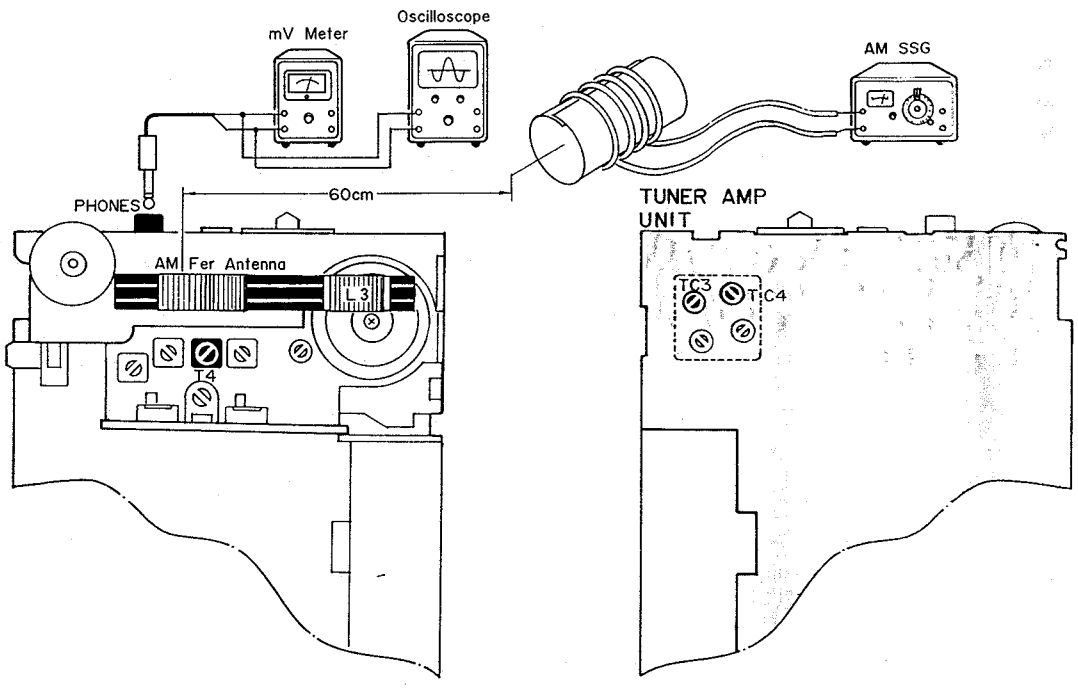


Fig. 11

- **Preparation**

Emit radio waves from an AM SSG using coil antenna as shown in illustration.
Adjust after centering TC1–TC4.

• To Adjust

Frequency of AM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 515 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T4	515 kHz can be received.
2. 1,650 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Minimum (turn the tuning knob clockwise until high end.)	TC4	1,650 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 515 ~ 1,650 kHz are covered.			
4. 600 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 600 kHz.	L3 (Coil of bar antenna)	Maximum output.
5. 1,400 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 1,400 kHz.	TC3	Maximum output
6. Repeat (4) and (5) alternately and confirm that tuning pointer indication is correct.			

Note: After adjusting L3 (Coil of bar antenna), melt electro wax with soldering iron and fix it in position.

5.6 FM IF ADJUSTMENT

• Connection Diagram

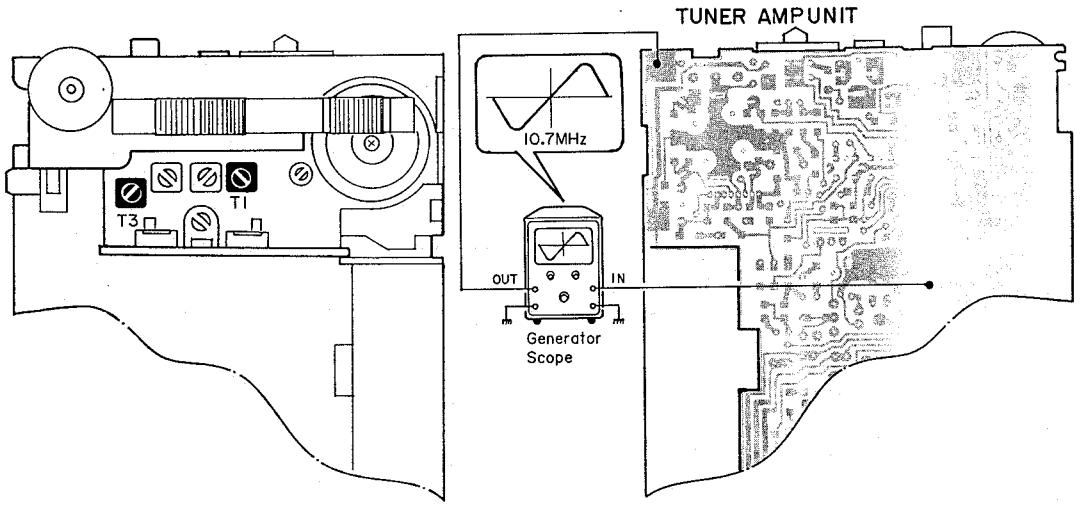


Fig. 12

• To Adjust

1. Apply minimum output signal required to check generator scope S curve and adjust T1 and T3 so that S curve wave is symmetnical at both top and bottom and so that the wave has optimum linearity.

5.7 FM TRACKING ADJUSTMENT

- **Connection Diagram**

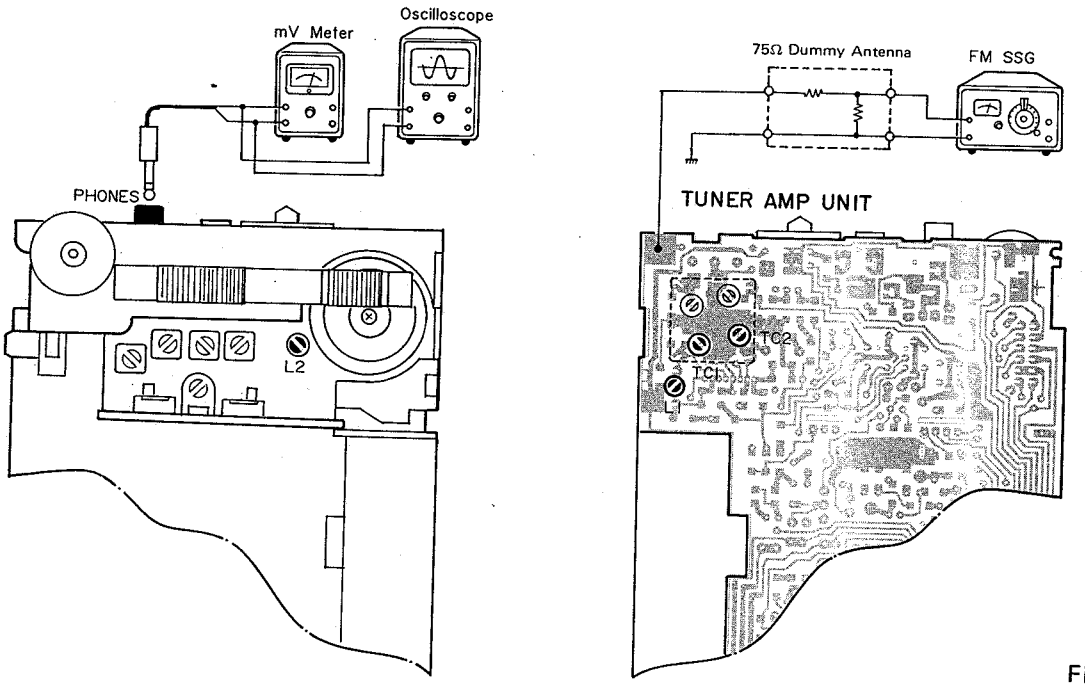


Fig. 13

- **To Adjust**

Frequency of FM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 87 MHz (400 Hz, 75 kHz deviation) output level 30 dB (μV).	Maximum (turn the tuning knob counterclockwise until low end.)	L2	87 MHz can be received.
2. 109.5 MHz (400 Hz, 75 kHz deviation) output level 30 dB (μV).	Minimum (turn the tuning knob clockwise until high end.)	TC2	109.5 MHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 87 ~ 109.5 MHz are received.			
4. 90 MHz (400 Hz, 75 kHz deviation) output level 10 ~ 20 dB (μV).	Tuned to 90 MHz.	L1	Maximum output
5. 106 MHz (400 Hz, 75 kHz deviation) output level 10 ~ 20 dB (μV).	Tuned to 106 MHz.	TC1	Maximum output
6. Repeat (4) and (5) alternately and adjust until tracking error disappears.			

5.8 FM MPX ADJUSTMENT

- **Connection Diagram**

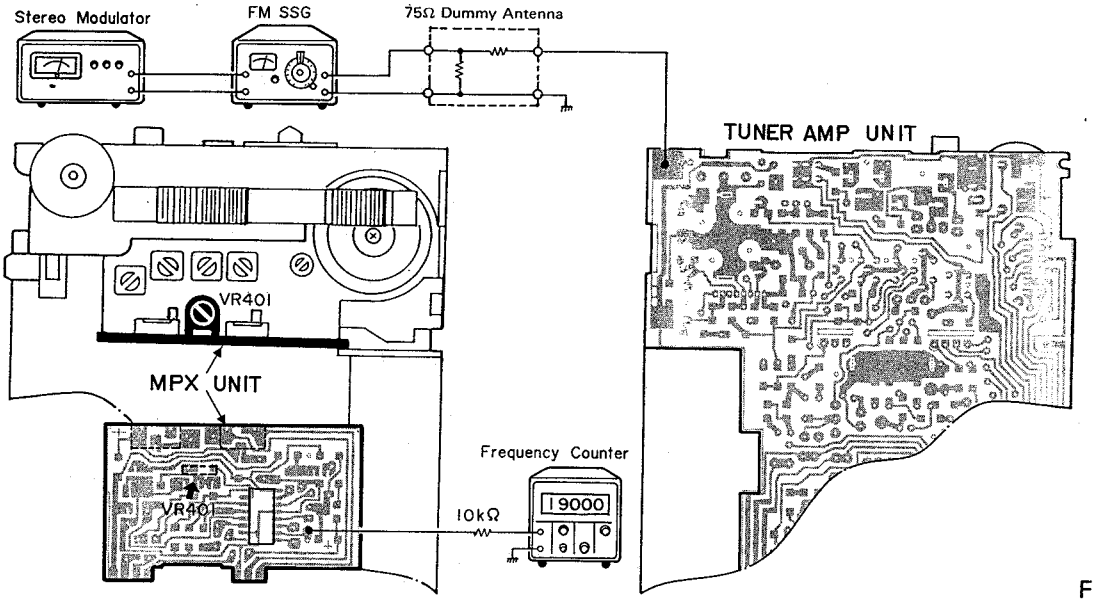


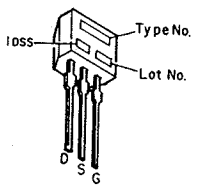
Fig. 14

- **To Adjust**

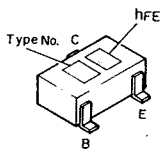
1. Using the FM SSG, apply a 98 MHz, 10 dB signal to the antenna terminals and tune to 98 MHz.
2. Set output of the FM SSG to 60 dB and turn modulation OFF.
3. Adjust VR401 until a reading of 19kHz ± 20Hz is obtained on the frequency counter.

IC's and Transistors

2SK161



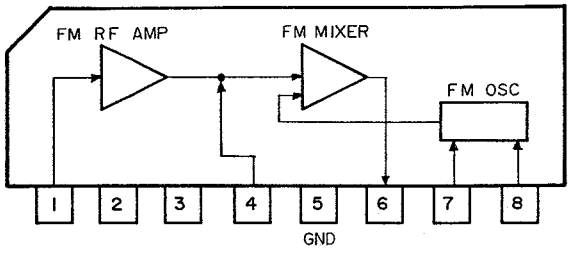
2SA1162
2SB709
2SC2295
2SC2712
2SD601



Chip Transistor

Part No.	Indication (Type No., hfe)
2SA1162-SG	SG
2SA1162-SY	SY
2SB709-AR	AR
2SB709-AQ	AQ
2SC2295-B	VB
2SC2712-LG	LG
2SC2712-LY	LY
2SD601-YQ	YQ
2SD601-YR	YR

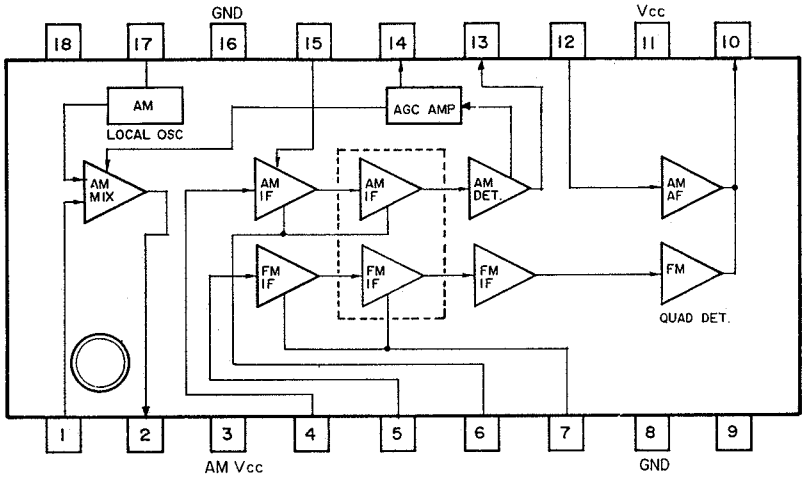
AN 7216



PIN FUNCTION (AN 7216)

Pin No.	Function and Operation
1	FM input
2	Vcc
3	Vcc
4	RF tank
5	GND
6	IF output
7	OSC
8	OSC

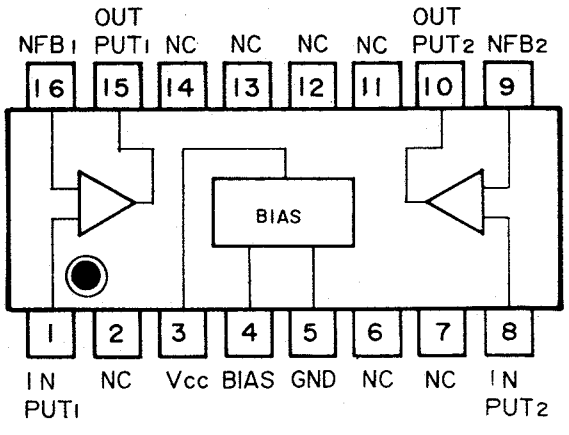
AN7221



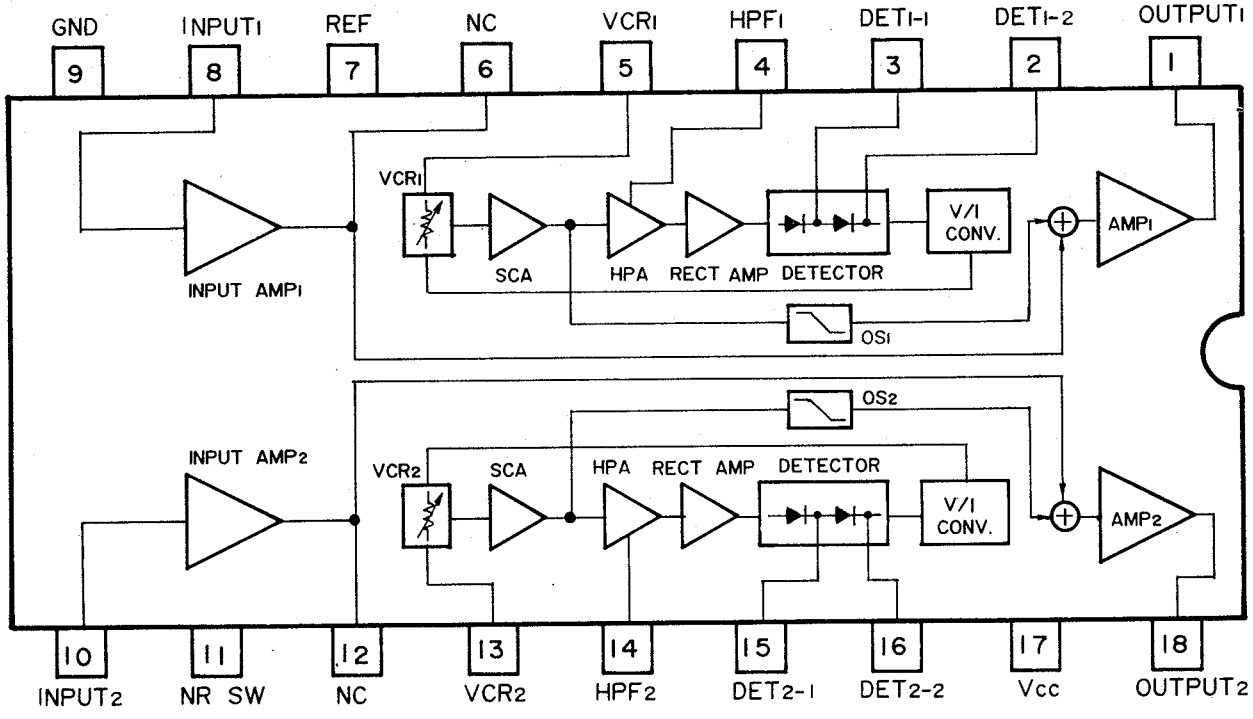
PIN FUNCTION (AN7221)

Pin No.	Function and Operation
1	AM RF input
2	AM MIX output
3	AM RF MIX Vcc
4	AM IF input
5	FM IF input
6	Bypass
7	Bypass
8	GND
9	FM phase shift
10	AM/FM output
11	Vcc
12	AM AF input
13	AM detector output
14	Indicator
15	AGC
16	AM RF MIX GND
17	Local oscillator
18	Bypass

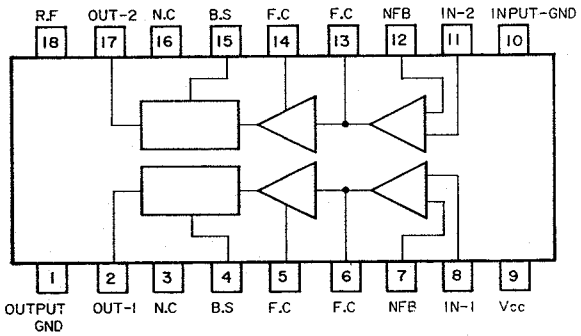
BAF 3304



HA12048FP



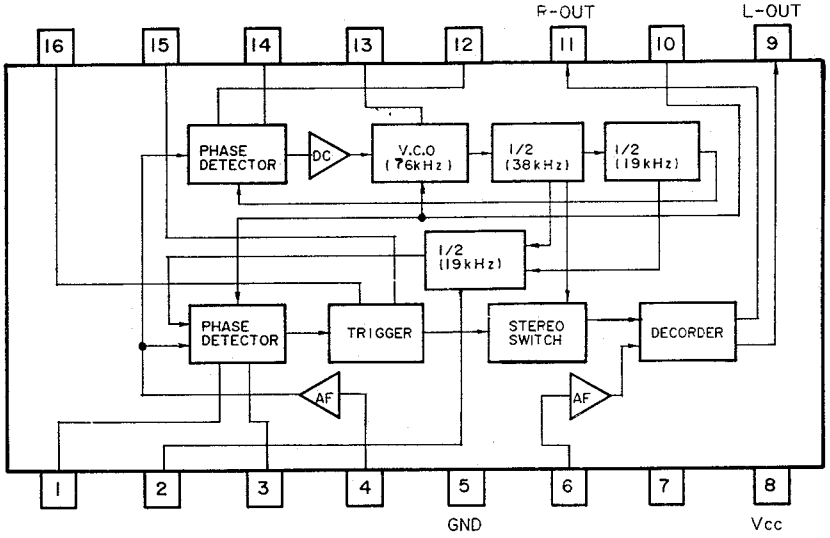
AN7118S



PIN FUNCTION (AN7118S)

Pin No.	Pin Name	Function and Operation	Pin No.	Pin Name	Function and Operation
1	GND	GND (output side)	10	GND	GND (input side)
2	OUT (1)	Lch output	11	IN(2)	Rch input
3	N.C		12	NFB	Rch negative feedback
4	B.S	Lch boot strap	13	F.C	Rch phase compensation pin
5	F.C	Lch phase compensation pin	14	F.C	Rch phase compensation pin
6	F.C	Lch phase compensation pin	15	B.S	Rch boot strap
7	NFB	Lch negative feedback	16	N.C	
8	IN(1)	Lch input	17	OUT(2)	Rch output
9	Vcc	Vcc	18	R.F	Ripple filter

BAF1360



PIN FUNCTION (BAF 1360)

Pin No.	Function and Operation
1	Lamp filter
2	fo check
3	Lamp filter
4	Input
5	GND
6	Input
7	VCO regulated power supply
8	Vcc
9	Lch Out
10	Compulsory monaural
11	Rch Out
12	PLL
13	VCO time constant
14	PLL loop filter
15	Lamp GND
16	Lamp output

6. DIAL STRINGING

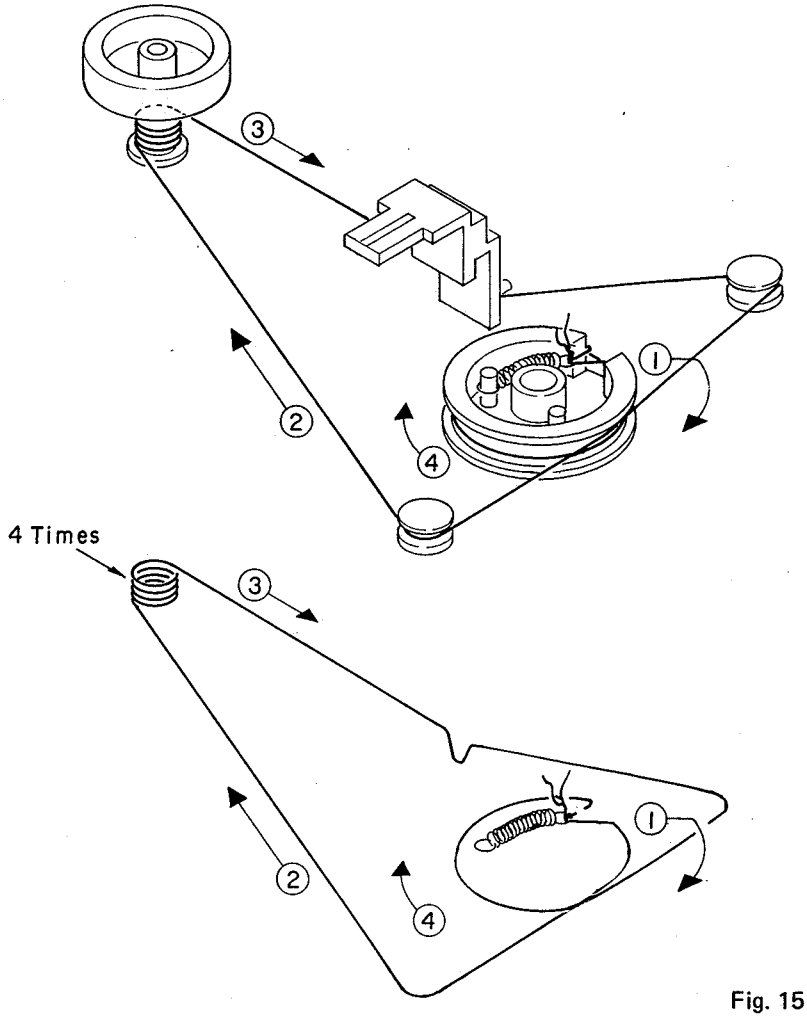
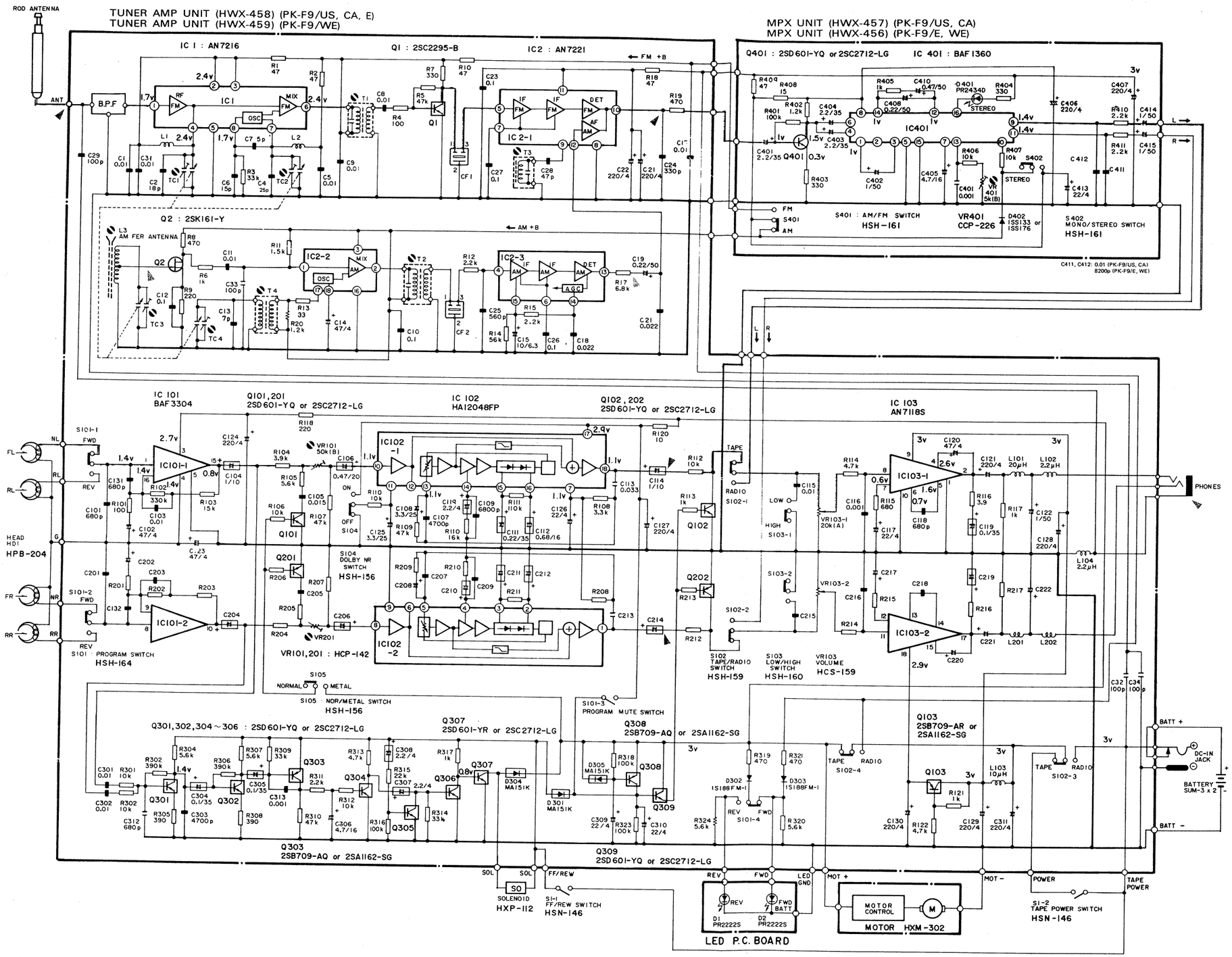


Fig. 15

7. SCHEMATIC CIRCUIT DIAGRAM



NOTICE

- Chip Resistor.
- Chip Capacitor.
- Chip Capacitor.
- Chip Transistor.
- Chip Diode

SWITCHES

TUNER AMP UNIT

- S101 : PROGRAM SWITCH ..... FWD — REV
- S102 : TAPE/RADIO SWITCH ..... TAPE — RADIO
- S103 : LOW/HIGH SWITCH ..... LOW — HIGH
- S104 : DOLBY NR SWITCH ..... ON — OFF
- S105 : NORMAL/METAL SWITCH ..... NORM — METAL

MPX UNIT

- S401 : AM/FM SWITCH ..... AM — FM
- S402 : MONO/STEREO SWITCH ..... MONO — STEREO

MISCELLANEOUS

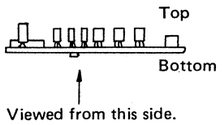
- SI-1 : FF/REW SWITCH ..... ON — OFF
- SI-2 : TAPE POWER SWITCH ..... ON — OFF

The underlined indicates the switch position.

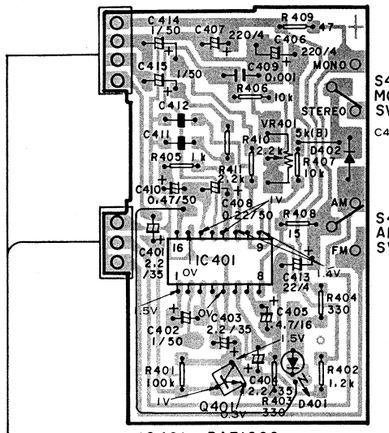
Fig. 16

8. CONNECTION DIAGRAM

- Parts mounted onto the amp unit are listed separately in the following manner.
  Page 20: Chip parts installed on the bottom of the P.C board.
  Page 22: Parts other than the chip parts installed on the bottom.



MPX UNIT (HWX-457) (PK-F9/US, CA)
MPX UNIT (HWX-456) (PK-F9/E, WE)

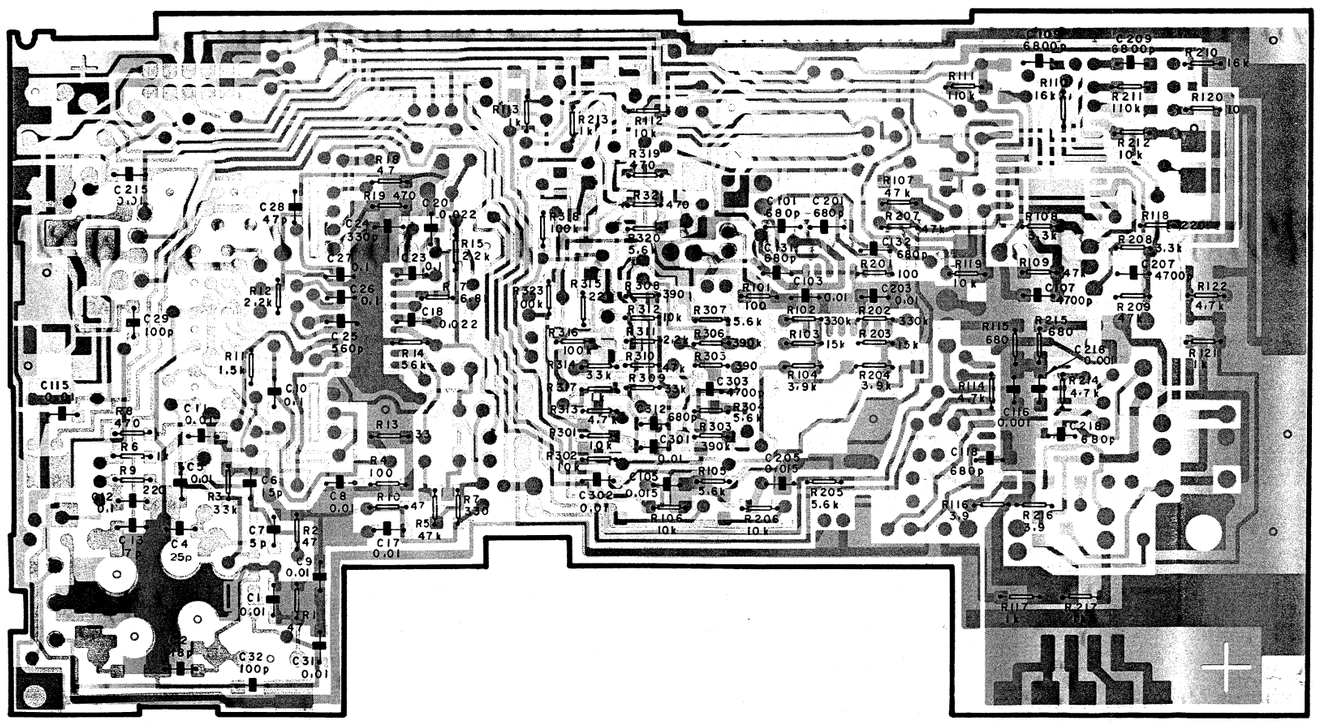


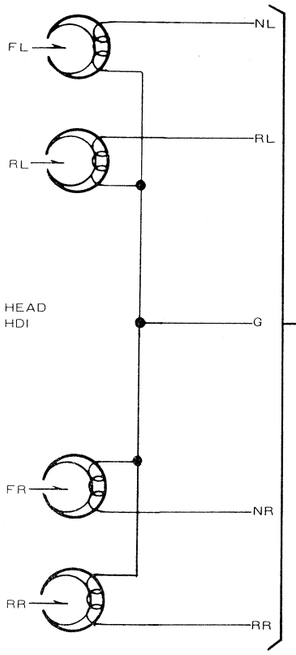
C411, C412: 0.01 (PK-F9/US, CA)
8200p (PK-F9/E, WE)

IC401 : BAF1360
Q401: 2SD601-YQ or 2SC2712-LG
D401: PR2434D
D402: ISS133 or ISS176

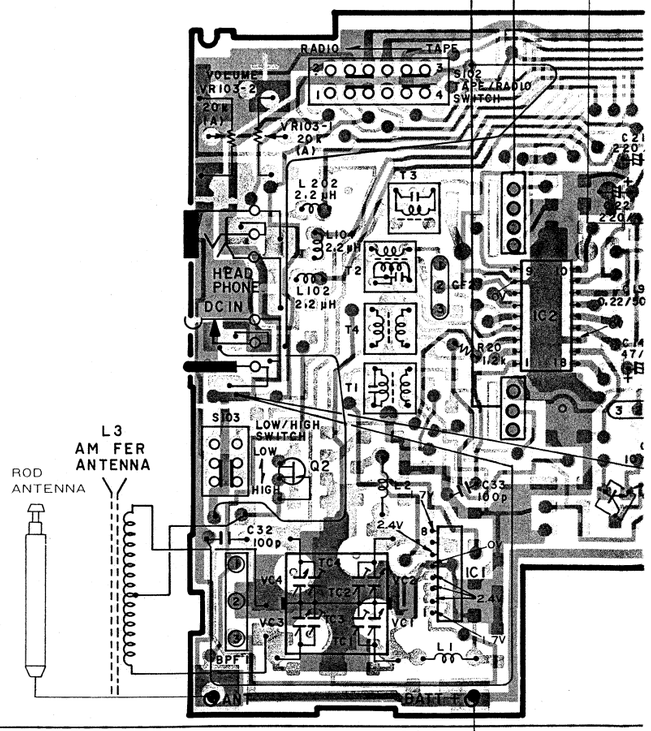
TUNER AMP UNIT (HWX-458) (PK-F9/US, CA,
TUNER AMP UNIT (HWX-459) (PK-F9/WE)

TUNER AMP UNIT (HWX-458) (PK-F9/US, CA, E)
TUNER AMP UNIT (HWX-459) (PK-F9/WE)





IC,Q Q2 IC1 IC2
ADJ L3 TC1~4 T1 T4 T2 T3



IC1 : AN7216 IC2 : AN7221 IC101 : BAF3304
Q1 : 2SC2245-B Q101, 20 , 301, 302, 304~30
Q103 : 2SB709-AR or 2SA1162-SG Q303, 3
D301, 304, 305 : MA151K D302, 303 : IS1

MPX UNIT (HWX-457) (PK-F9/US, CA)
MPX UNIT (HWX-456) (PK-F9/E, WE)

S402
MONO/STEREO
SWITCH

C411, C412: 0.01 (PK-F9/US, CA)
8200p (PK-F9/E, WE)

S401
AM/FM
SWITCH

LED P. C. BOARD

D1 PR2222S
D2 PR2222S
REV
FWD
BATT

SI-1
FF/REW
SWITCH

SI-2
TAPE
POWER
SWITCH

SOLENOID
SO

TUNER AMP UNIT (HWX-458) (PK-F9/US, CA, E)
TUNER AMP UNIT (HWX-459) (PK-F9/WE)

IC, Q
ADJ L3
Q2
TC1~4
T1 T4 T2 T3
IC1
IC2
IC101
VR101 VR201
IC103 IC102

S102 TAPE/RADIO SWITCH
S103 LOW/HIGH SWITCH
S104 DOLBY NR SWITCH
S105 NORM/METAL SWITCH
S106 PROGRAM SWITCH

L1 L2 L3
AM FER ANTENNA
ROD ANTENNA

MOTOR CONTROL
M
MOTOR HXM-302

IC1: AN7216 IC2: AN7221 IC101: BAF3304 IC102: HA12048FP IC103: AN7118S
Q1: 2SC2295-B Q101, 201, 301, 302, 304~306, 309: 2SD601-YQ or 2SC2712-LG Q2: 2SK161-Y
Q103: 2SB709-AR or 2SA1162-SG Q303, 308: 2SB709-AQ or 2SA1162-SG Q102, 202, 307: 2SD601-YR or 2SC2712-LG
D301, 304, 305: MA151K D302, 303: 1S188FM-1

BATTERY
SUM-3×2

Fig. 17

9. CHASSIS EXPLODED VIEW

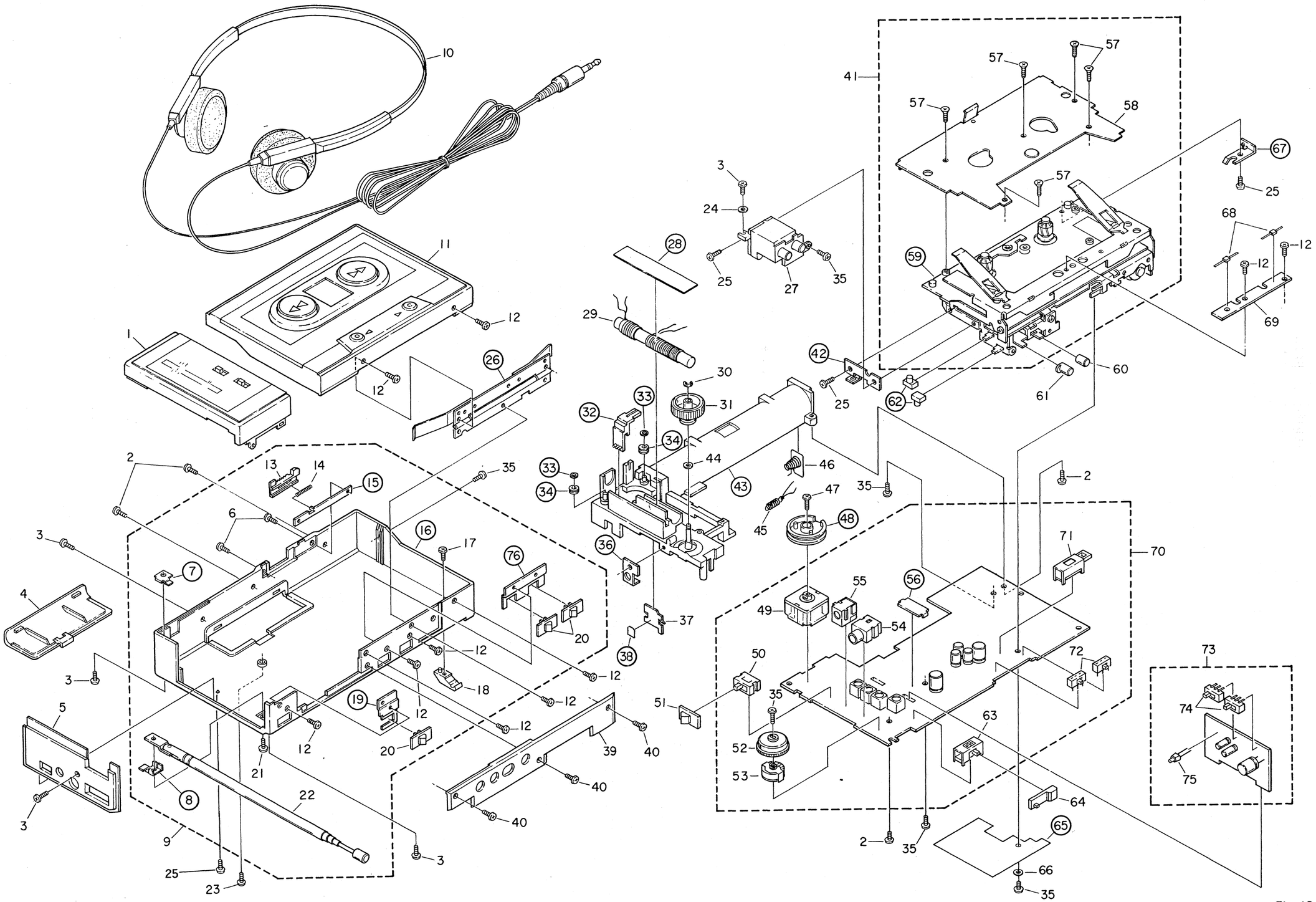


Fig. 18

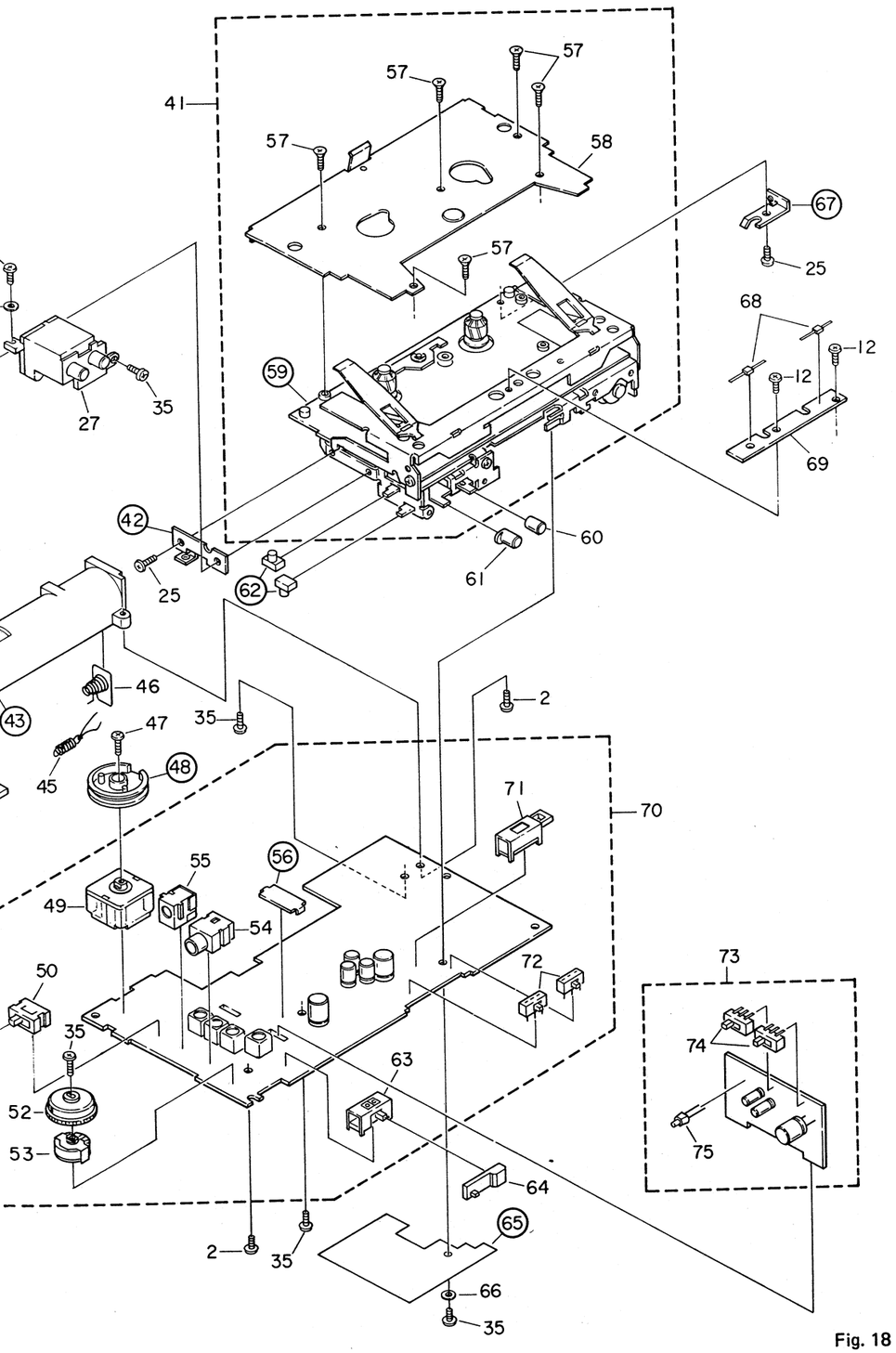


Fig. 18

- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

• Parts List

Mark	No.	Part No.	Description
	1.	HXB-357	Front Case Assy
	2.	HBA-374	Screw M1.7 x 5
	3.	HBA-376	Screw M1.7 x 6
	4.	HNS-780	Cover
	5.	HNS-842	Escutcheon
	6.	HBA-163	Screw M1.7 x 2.5
	7.		Terminal A
	8.		Terminal B
	9.	HXB-352	Case Assy (PK-F9/US)
		HXB-354	Case Assy (PK-F9/CA)
		HXB-355	Case Assy (PK-F9/E)
		HXB-356	Case Assy (PK-F9/WE)
	10.	HPH-102	Headphone
	11.	HXB-339	Door Assy
	12.	HBA-159	Screw M1.7 x 1.6
★	13.	HAC-358	Knob
	14.	HBH-541	Spring
	15.		Slide
	16.		Case
	17.	HBA-165	Screw M1.7 x 3
	18.	HNS-773	Holder
	19.		Bracket
★	20.	HAC-387	Button
	21.	HBA-344	Screw M2 x 3
	22.	HDX-115	Rod Antenna
	23.	HBA-171	Screw M1.7 x 6
	24.	HBF-193	Washer
	25.	HBA-161	Screw M1.7 x 2
	26.		Bracket Assy
	27.	HXB-343	Lever Assy
	28.		Cover
	29.	HTB-190	Antenna
	30.	YE15FMC	Washer
★	31.	HAA-241	Tuning Knob
	32.		Pointer
	33.		Washer
	34.		Pulley
	35.	HBA-165	Screw M1.7 x 3
	36.		Bracket
	37.	HNC-985	Terminal
	38.		Spacer
	39.	HNS-779	Escutcheon
	40.	HBA-169	Screw M1.7 x 4.5
	41.	HXB-345	Cassette Mechanism Assy
	42.		Bracket
	43.		Chassis Assy
	44.	HBF-185	Washer
	45.	HBH-561	Spring
	46.	HBH-543	Spring
	47.	HBA-168	Screw M1.7 x 4.5
	48.		Drum
	49.	HCL-124	Variable Condencer
	50.	HSH-160	Switch (LOW/HIGH)
★	51.	HAC-369	Knob (LOW/HIGH)
★	52.	HAA-238	Knob (VOLUME)
★★	53.	HCS-159	Volume
	54.	HKN-151	Jack (PHONES)
	55.	HKN-142	Jack (DC IN)
	56.		Shield
	57.	HBA-198	Screw M1.7 x 2
	58.	HXB-342	Cover Unit
	59.		Cassette Mechanism Unit
★	60.	HAC-361	Button (One-side Stop)
★	61.	HAC-360	Button (PROGRAM)
	62.		Cap
★★	63.	HSH-159	Switch (TAPE/RADIO)
	64.	HNV-786	Lever (TAPE/RADIO)
	65.		Shield
	66.	HBF-193	Washer
	67.		Bracket
★	68.	PR2222S	LED
	69.	HNP-548	P.C. Board
	70.	HWX-458	Tuner Amp Unit (PK-F9/US, CA, E)
		HWX-459	Tuner Amp Unit (PK-F9/WE)
★★	71.	HSH-164	Switch (FWD/REV)
★★	72.	HSH-156	Switch (DOLBY NR, TAPE)
	73.	HWX-457	MPX Unit (PK-F9/US, CA)
		HWX-456	MPX Unit (PK-F9/E, WE)
★★	74.	HSH-161	Switch (AM/FM, MONO/ST)
★	75.	PR2434D	LED
	76.		Bracket

10. CASSETTE MECHANISM EXPLODED VIEW

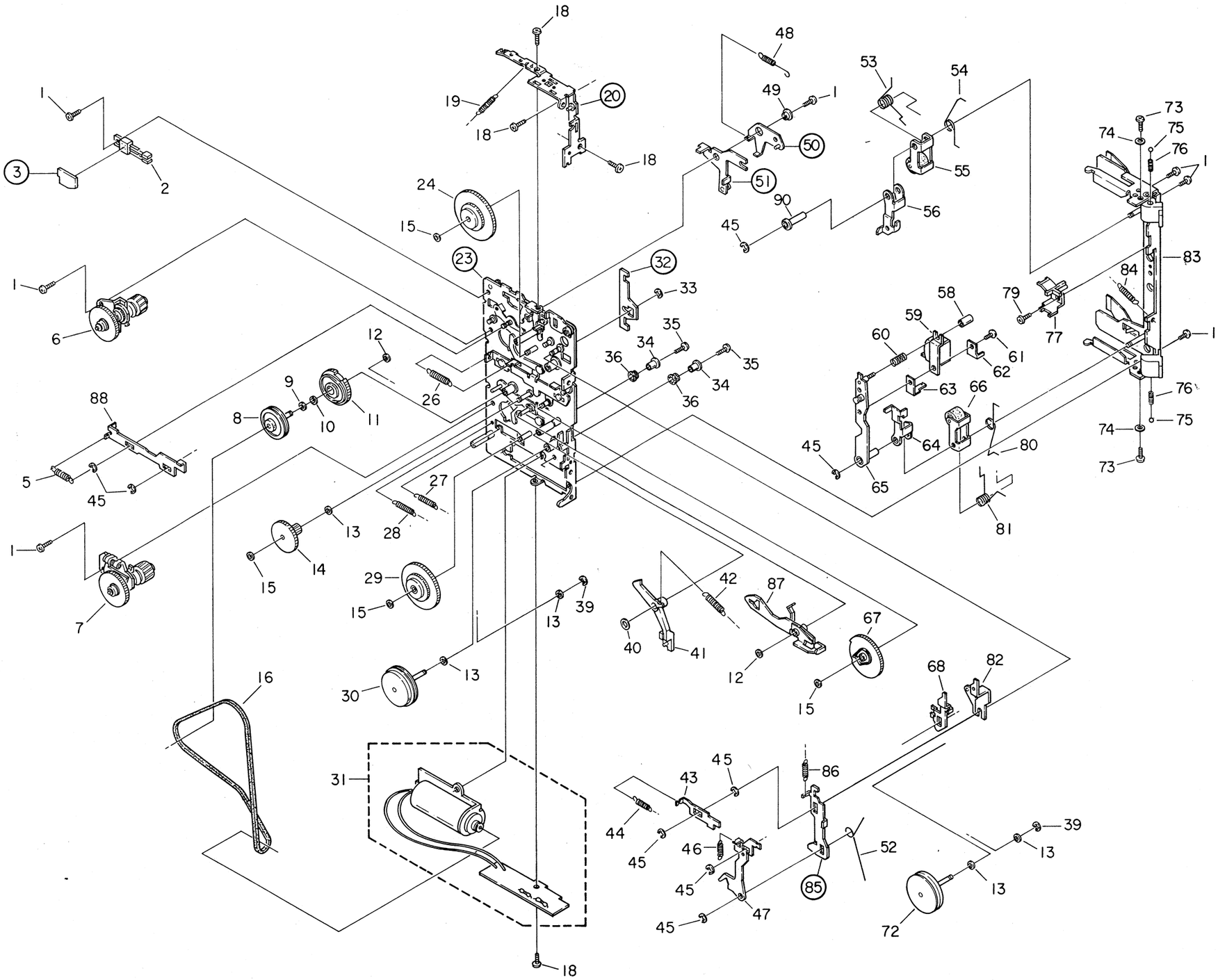


Fig. 19

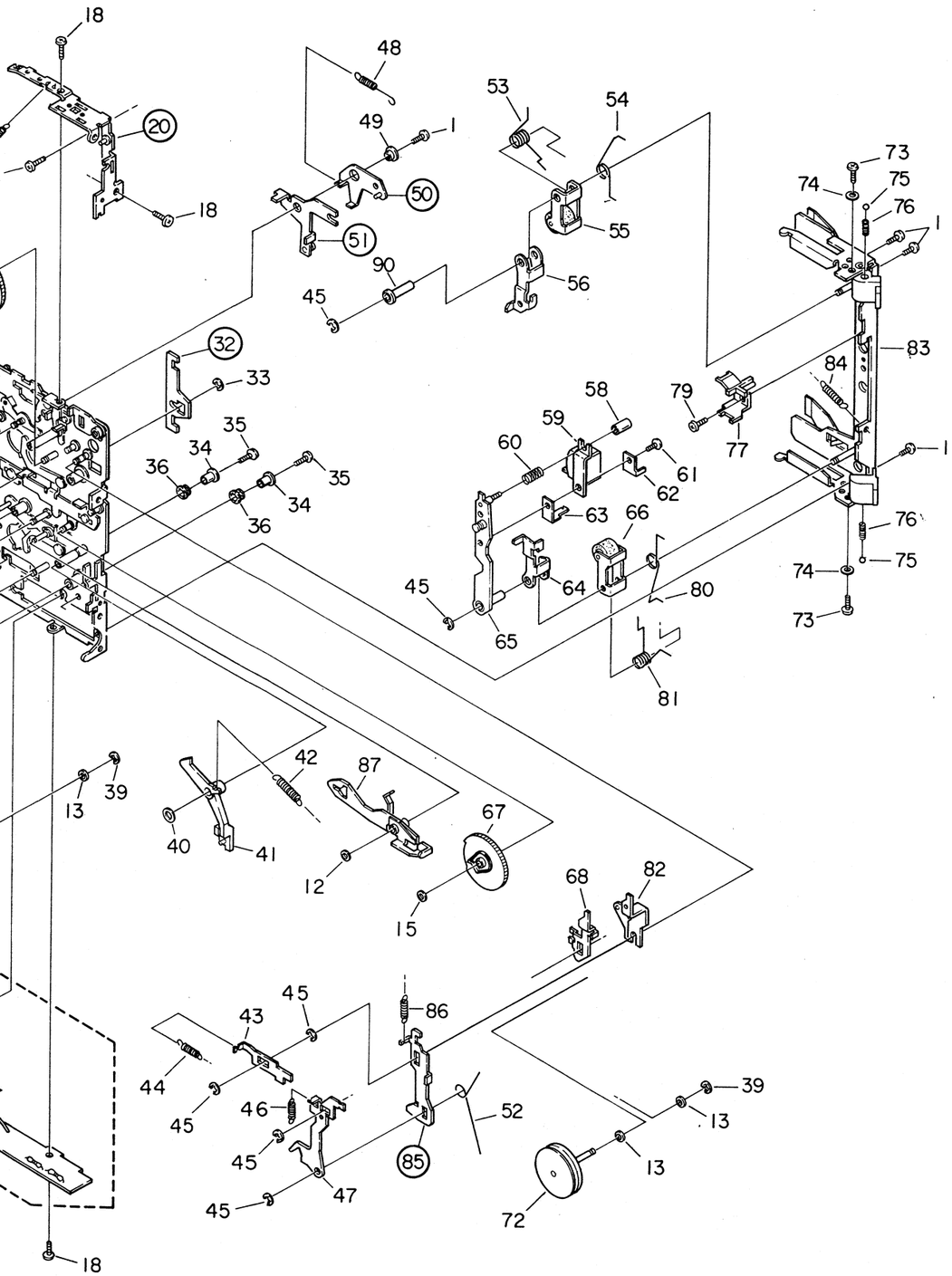


Fig. 19

• Parts List

Mark	No.	Part No.	Description
	1.	HBA-163	Screw M1.7 x 2.5
★★	2.	HSN-146	Switch (FF/REW, POWER)
	3.		P.C. Board
	4.	VACANT	–––
	5.	VACANT	–––
★★	6.	HXB-257	Reel Unit
★★	7.	HXB-256	Reel Unit
	8.	HXB-276	Pulley Unit
	9.	HBF-117	Washer
	10.	HBF-181	Washer
	11.	HNV-760	Gear
	12.	HBF-180	Washer
	13.	HBF-179	Washer
	14.	HNV-758	Gear
	15.	HBF-145	Washer
★★	16.	HNT-158	Belt
	17.	VACANT	–––
	18.	HBA-160	Screw M1.7 x 1.8
	19.	HBH-549	Spring
	20.		Holder Unit
	21.	VACANT	–––
	22.	VACANT	–––
	23.		Chassis Unit
	24.	HXB-258	Gear Unit
	25.	VACANT	–––
	26.	HBH-520	Spring
	27.	HBH-522	Spring
	28.	HBH-519	Spring
	29.	HXB-259	Gear Unit
	30.	HXB-261	Flywheel Unit
★★	31.	HXM-302	Motor
	32.		Lever
	33.	CBG-005	Washer
	34.	HLA-507	Collar
	35.	HBA-205	Screw M1.7 x 4.5
	36.	HNT-141	Bush
	37.	HBA-168	Screw M1.7 x 4.5
	38.	HXP-112	Solenoid
	39.	YE12FUC	Washer
	40.	HBF-187	Washer
	41.	HNV-762	Arm
	42.	HBH-522	Spring
	43.	HNC-908	Lever
	44.	HBH-526	Spring
	45.	YE15FUC	Washer

Mark	No.	Part No.	Description
	46.	HBH-524	Spring
	47.	HNC-909	Lever (PROGRAM)
	48.	HBH-516	Spring
	49.	HLA-509	Collar
	50.		Arm Unit (STOP)
	51.		Arm Unit (PLAY)
	52.	HBH-530	Spring
	53.	HBH-534	Spring
	54.	HBH-533	Spring
★★	55.	HXB-263	Pinch Roller Unit
	56.	HNC-903	Arm
	57.	VACANT	–––
	58.	HLA-508	Screw
★★	59.	HPB-204	Head
	60.	HBH-529	Spring
	61.	HBA-175	Screw M2 x 2.5
	62.	HNC-905	Clamper
	63.	HNC-902	Spacer
	64.	HNC-904	Arm
	65.	HXB-267	Arm Unit
★★	66.	HXB-264	Pinch Roller Unit
	67.	HNV-759	Gear
	68.	HNC-906	Lever (STOP)
	69.	VACANT	–––
	70.	VACANT	–––
	71.	VACANT	–––
	72.	HXB-262	Flywheel Unit
	73.	HBA-154	Screw M1.4 x 3
	74.	HBE-129	Washer
	75.	HNR-191	Ball
	76.	HBH-515	Spring
	77.	HNV-761	Guide
	78.	VACANT	–––
	79.	HBA-165	Screw M1.7 x 3
	80.	HBH-532	Spring
	81.	HBH-535	Spring
	82.	HXB-269	Lever Unit (PLAY)
	83.	HXB-430	Holder Unit,
	84.	HBH-528	Spring
	85.		Slider
	86.	HBH-521	Spring
	87.	HXB-275	Arm Unit
	88.	VACANT	–––
	89.	VACANT	–––
	90.	HLA-510	Shaft

11. PACKING METHOD

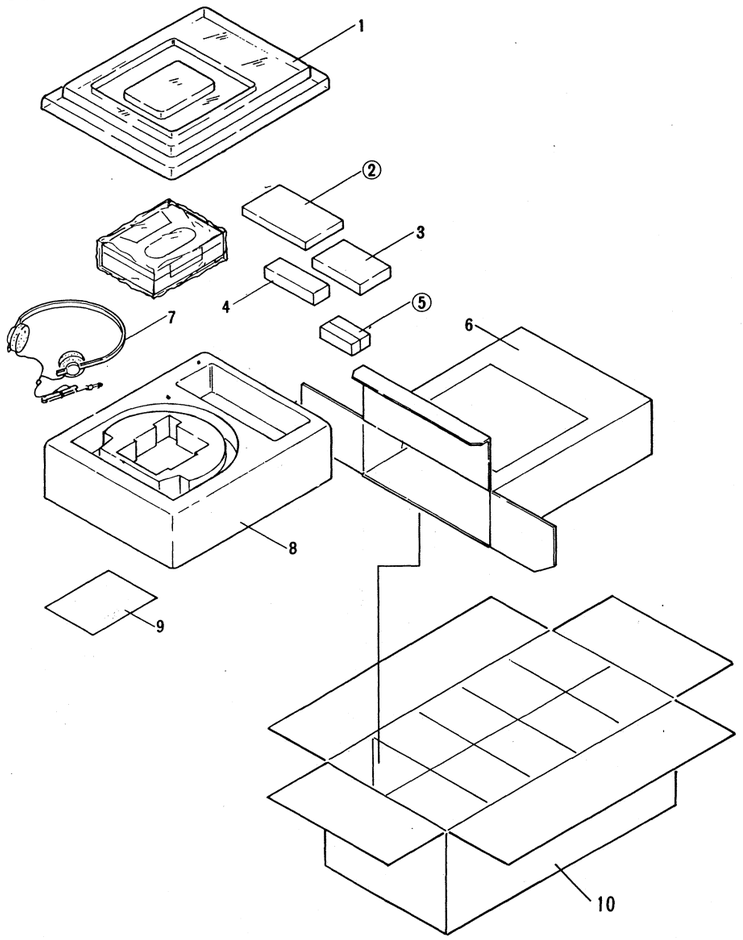


Fig. 20

- Parts List

Mark	No.	Part No.	Description
	1	HHA-867	Protector B
	2		Recorded Cassette Tape
	3.	HMX-113	Soft Case
	4.	HMX-111	Belt
	5.		Battery
	6.	HHA-924	Carton
	7.	HPH-102	Headphone
	8.	HHA-866	Protector A
	9.	HRD-224	Owner's Manual (English, French, German)
		HRD-225	Owner's Manual (PK-F9/E,WE) (Spanish, Swedish, Dutch, Italy, Chinese, Arabic)
	10.	HHA-868	Contain Box (PK-F9/US)

12. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*		*RN1/4SR 5 6 2 1 F*

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

MPX Unit (HWX-457) (PK-F9/US, CA)
MPX Unit (HWX-456) (PK-F9/E,WE)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC401	BAF1360
★★	Q401 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SC2712-LG or 2SC2712-LY
★	D401	PR2434D
★	D402	1SS133 or 1SS176
★★	S401, S402 Switch (AM/FM, MONO/STEREO)	HSH-161
★★	VR401 Semi-Fixed	CCP-226

CHIP RESISTORS

Mark	Symbol & Description	Part No.
	R401–R411	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C403, C404	CEA2R2M35LS
	C402, C414, C415	CEA010M50LS
	C405	CEA4R7M16LS
	C406, C407	CEA221M4LL
	C408	CEAR22M50LS
	C409	CQSH102J50
	C410	CEAR47M50LS
	C411, C412 Chip Capacitor (PK-F9/US, CA)	CKSYB103K50
	C411, C412 Chip Capacitor (PK-F9/E, WE)	CKSYB822K50
	C413	CEA220M4LS

Tuner Amp Unit (HWX-458) (PK-F9/US, CA, E)
Tuner Amp Unit (HWX-459) (PK-F9/WE)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	AN7216
★★	IC2	AN7221
★★	IC101	BAF3304
★★	IC102	HA12048FP
★★	IC103	AN7118S
★★	Q1 Chip Transistor	2SC2295-B
★★	Q2	2SK161-Y
★★	Q101, Q201, Q301, Q302,	2SD601-YQ or
★★	Q304 – Q306, Q309 Chip Transistor	2SD601-YR or 2SC2712-LG or 2SC2712-LY

12. ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω	*56 × 10^1*	*561 . . . . . RD1/4PS 5 6 1 J*	
47kΩ	*47 × 10^3*	*473 . . . . . RD1/4PS 4 7 3 J*	
0.5Ω	*0R5*	*. . . . . RN2H 0 R 5 K*	
1Ω	*010*	*. . . . . RS1P 0 1 0 K*	

Ex.2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ *562 × 10^1 . . . . . RN1/4SR 5 6 2 1 F*

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

MPX Unit (HWX-457) (PK-F9/US, CA)
MPX Unit (HWX-456) (PK-F9/E,WE)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC401	BAF1360
★★	Q401 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SC2712-LG or 2SC2712-LY
★	D401	PR2434D
★	D402	1SS133 or 1SS176
★★	S401, S402 Switch (AM/FM, MONO/STEREO)	HSH-161
★★	VR401 Semi-Fixed	CCP-226

CHIP RESISTORS

Mark	Symbol & Description	Part No.
	R401–R411	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C403, C404	CEA2R2M35LS
	C402, C414, C415	CEA010M50LS
	C405	CEA4R7M16LS
	C406, C407	CEA221M4LL
	C408	CEAR22M50LS
	C409	CQSH102J50
	C410	CEAR47M50LS
	C411, C412 Chip Capacitor (PK-F9/US, CA)	CKSYB103K50
	C411, C412 Chip Capacitor (PK-F9/E, WE)	CKSYB822K50
	C413	CEA220M4LS

Tuner Amp Unit (HWX-458) (PK-F9/US, CA, E)
Tuner Amp Unit (HWX-459) (PK-F9/WE)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	AN7216
★★	IC2	AN7221
★★	IC101	BAF3304
★★	IC102	HA12048FP
★★	IC103	AN7118S
★★	Q1 Chip Transistor	2SC2295-B
★★	Q2	2SK161-Y
★★	Q101, Q201, Q301, Q302, Q304 – Q306, Q309 Chip Transistor	2SD601-YQ or 2SD601-YR or 2SC2712-LG or 2SC2712-LY
★★	Q103 Chip Transistor	2SB709-AR or 2SA1162-SG
★★	Q303, Q308 Chip Transistor	2SB709-AQ or 2SB709-AR or 2SA1162-SG or 2SA1162-SY
★	D301, D304, D305 Chip Diode	MA151K
★	D302, D303	1S188FM-1
	CF1 Ceramic Filter	HTF-126
	CF2 Ceramic Filter (PK-F9/US, CA, E)	HTF-153
	CF2 Ceramic Filter (PK-F9/WE)	HTF-154
	L1 Coil	HTC-235
	L2 Coil	HTC-236
	L101, L201	HTF-150
	L102, L104, L202 Coil	CTB-081
	L103	HTF-152
★★	S101 Switch (PROGRAM)	HSH-164
★★	S102 Switch (TAPE/RADIO)	HSH-159
★★	S103 Switch (LOW/HIGH)	HSH-160
★★	S104, S105 Switch (DOLBY NR, NORM/METAL)	HSH-156
	T2 IF Transformer	HTE-159
	T3 IF Transformer	HTE-160
	T4 Coil	HTB-189
	VC1 Variable Condencer	HCL-124
★★	VR101, VR201 Semi-Fixed	HCP-142
★★	VR103 Volume	HCS-159
	BPF1 Filter	HWW-121

RESISTORS

Mark	Symbol & Description	Part No.
	R1–R15, R17–R19, R101–R122, R201–R217, R301–R321, R323 Chip Resistor	RS1/8S□□□J
	R20, R324	RD1/6PS□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C5, C8, C9, C11, C17, C31, C103, C115, C203, C215, C301, C302 Chip Capacitor	CKSYB103K50
	C2 Chip Capacitor	CCSSL180J50
	C4 Chip Capacitor	CCSCH250J50
	C6 Chip Capacitor	CCSCH150J50
	C7 Chip Capacitor	CCSCH050C50
	C10, C12, C23, C26, C27 Chip Capacitor	CKSYF104Z25
	C13 Chip Capacitor	CCSUJ070D50
	C14, C102, C120, C123, C202, C220	CEA470M4LS
	C15	CEA100M6R3LS
	C18, C20 Chip Capacitor	CKSYB223K25
	C19	CEAR22M50LS
	C21, C22, C121, C124, C127–C130, C221, C311	CEA221M4LL
	C24 Chip Capacitor	CKSYB331K50
	C25 Chip Capacitor	CKSYB561K50
	C28 Chip Capacitor	CCSCH470J50
	C29, C32 Chip Capacitor	CCSSL101J50
	C33, C34	CKDYB101K50
	C101, C118, C131, C132, C201, C218, C312 Chip Capacitor	CKSYB681K50
	C104, C114, C204, C214 Chip Capacitor	CSZS010M10
	C105, C205 Chip Capacitor	CKSYB153K50
	C106, C206 Chip Capacitor	CSZSR47M20
	C107, C207, C303 Chip Capacitor	CKSYB472K50
	C108, C125, C208	CEA3R3M25LS
	C109, C209 Chip Capacitor	CKSYB682K50
	C110, C210, C307, C308 Chip Capacitor	CSZS2R2M4
	C111, C211 Chip Capacitor	CSZSR22M35
	C112, C212 Chip Capacitor	CSZSR68M16
	C113, C213	CQMA333J50L
	C116, C216 Chip Capacitor	CKSYB102K50
	C117, C126, C217, C309	CEA220M4LS
	C119, C219, C304, C305 Chip Capacitor	CSZS0R1M35
	C122, C222	CEA010M50LS
	C306	CEA4R7M16LS
	C310	CEA150M6R3LS
	C313	CKDYB102K50L

LED P.C. Board

Mark	Symbol & Description	Part No.
★	D1, D2 LED	PR2222S

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	HD1 Head	HPB-204
	SO Solenoid	HXP-112
★★	S1 Switch	HSN-146
★★	M Motor	HXM-302